

WHAT IS CLAIMED IS:

1 1. A reflection-type liquid crystal display comprising:
2 a transparent first substrate;
3 a transparent electrode provided on said transparent first
4 substrate;
5 a second substrate;
6 an insulator film which is provided on said second substrate
7 and also on a surface of which is formed an uneven structure;
8 a reflecting electrode which is provided on said insulator
9 film in such a shape as reflecting said uneven structure; and
10 a liquid crystal layer sandwiched by a side of said
11 transparent electrode formed on said first substrate and a side
12 of said reflecting electrode provided on said second substrate;
13 wherein said insulator film includes a first insulating
14 layer in which a large number of depressions are irregularly
15 arranged which are isolated (as surrounded by protrusions) and a
16 second insulating layer which covers said first insulating layer
17 entirely.

1 2. The reflection-type liquid crystal display according to
2 Claim 1, wherein said depressions are constructed by a part
3 surrounded by a large number of stripe-shaped protrusions
4 arranged irregularly.

1 3. The reflection-type liquid crystal display according to
2 Claim 1, wherein said uneven structure is formed by a repetition
3 of an irregular shape which is given in units of one picture element
4 or more.

1 4. The reflection-type liquid crystal display according to
2 Claim 1, wherein said depressions and said protrusions each has
3 a smooth sectional shape formed by melting.

1 5. The reflection-type liquid crystal display according to
2 Claim 1, wherein:
3 a liquid crystal driving switching element is provided on said
4 second substrate; and
5 said insulator film serves also as a protection film for said
6 switching element.

1 6. The reflection-type liquid crystal display according to
2 Claim 5, at least one of said first insulating layer and said second
3 insulating layer covers at least one of a drain wiring line and
4 a gate wiring line of said switching element.

1 7. The reflection-type liquid crystal display according to
2 Claim 1, wherein at least one of said first insulating layer and
3 said second insulating layer has photo-absorbancy.

1 8. The reflection-type liquid crystal display according to
2 Claim 1, wherein:

3 a liquid crystal driving switching element is provided on
4 said second substrate; and

5 a contact hole is formed in said insulator film for
6 electrically interconnecting said liquid crystal driving
7 switching element and said reflecting electrode.

1 9. The reflection-type liquid crystal display according to

2 Claim 1, wherein said first insulating layer is made of an organic
3 or inorganic resin having photosensitivity.

1 10. The reflection-type liquid crystal display according
2 to Claim 1, wherein said second insulating layer is made of an
3 organic or inorganic resin having photosensitivity.

1 11. A method for manufacturing a reflection-type liquid
2 crystal display including: a transparent first substrate, a
3 transparent electrode provided on said transparent first
4 substrate, a second substrate, an insulator film which is provided
5 on said second substrate and also on a surface of which is formed
6 an uneven structure, a reflecting electrode which is provided on
7 said insulator film in such a shape as reflecting said uneven
8 structure, and a liquid crystal layer sandwiched by a side of said
9 transparent electrode formed on said first substrate and a side
10 of said reflecting electrode provided on said second substrate,
11 wherein said insulator film includes a first insulating layer in
12 which a large number of depressions are irregularly arranged which
13 are isolated as surrounded by protrusions and a second insulating
14 layer which covers said first insulating layer entirely, said
15 method comprising the steps of:

16 forming said first insulating layer;

17 forming, as a photolithography step, a resist pattern on said
18 first insulating layer;

19 etching said first insulating layer;

20 removing a residual resist film left on said first insulating
21 layer;

22 melting by heat treatment said first insulating layer thus

23 etched, to thereby smooth said uneven structure; and
24 forming said second insulating layer on said first
25 insulating layer thus melted.

1 12. A method for manufacturing a reflection-type liquid
2 crystal display including: a transparent first substrate, a
3 transparent electrode provided on said transparent first
4 substrate, a second substrate, an insulator film which is provided
5 on said second substrate and also on a surface of which is formed
6 an uneven structure, a reflecting electrode which is provided on
7 said insulator film in such a shape as reflecting said uneven
8 structure, and a liquid crystal layer sandwiched by a side of said
9 transparent electrode formed on said first substrate and a side
10 of said reflecting electrode provided on said second substrate,
11 wherein said insulator film includes a first insulating layer in
12 which a large number of depressions are irregularly arranged which
13 are isolated as surrounded by protrusions and a second insulating
14 layer which covers said first insulating layer entirely, said
15 method comprising the steps of:

16 forming said first insulating layer of an organic or
17 inorganic insulating material having photosensitivity;

18 forming an uneven-element pattern on said first insulating
19 layer by photo-exposure;

20 etch-developing said first insulating layer;

21 melting by heat treatment said first insulating layer thus
22 etch-developed, to thereby smooth said uneven structure; and

23 forming said second insulating layer on said first
24 insulating layer thus melted.

1 13. A method for manufacturing a reflection-type liquid
2 crystal display including: a transparent first substrate, a
3 transparent electrode provided on said transparent first
4 substrate, a second substrate, an insulator film which is provided
5 on said second substrate and also on a surface of which is formed
6 an uneven structure, a reflecting electrode which is provided on
7 said insulator film in such a shape as reflecting said uneven
8 structure, a liquid crystal layer sandwiched by a side of said
9 transparent electrode formed on said first substrate and a side
10 of said reflecting electrode provided on said second substrate,
11 a liquid crystal driving switching element provided on said second
12 substrate, a contact hole formed in said insulator film for
13 electrically interconnecting said liquid crystal driving
14 switching element and said reflecting electrode, wherein said
15 insulator film includes a first insulating layer in which a large
16 number of depressions are irregularly arranged which are isolated
17 as surrounded by protrusions and a second insulating layer which
18 covers said first insulating layer entirely, said method
19 comprising the steps of;

20 forming said second insulating layer of an organic or
21 inorganic insulating material having photosensitivity;

22 forming a pattern used to form said contact hole in said
23 second insulating layer; and

24 performing etch-developing on said second insulating layer,
25 to thereby form said contact hole.

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